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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,253	09/25/2003	Hiroshi Miyai	H6808.0024/P024	3185

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EXAMINER	
SOUW, BERNARD E	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/669,253	MIYAI ET AL.	
	Examiner	Art Unit	
	Bernard E Souw	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Amendment

1. The Amendment filed 01/24/2005 has been entered. The present Office Action is made with all the suggested amendments being fully considered.

Claims 1, 6 and 12 have been amended.

Pending in this office action are claims 1-14.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6-10 and 12-14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tanaka et al. (US Pat. Pub. 2001/0033683).

Tanaka et al. disclose an inspection method using an electron beam, comprising the steps of

(a) irradiating a sample 7 on which a pattern is formed with an electron beam 6, as shown in Fig.1 and recited in sect.[0052];

(b) generating an inspection image 21 and a reference image 22 shown in Fig.3 based on secondary electrons emitted by the sample, as recited in sect.[0052/ll.7-13 and sect.[066]/ll.1-7;

(c) determining an abnormal pattern 23 with defects 24 shown in Fig.3 based on a difference in the halftone values in each pixel between the inspection image 21 and reference image 22, as recited in sect.[0066]/ll.1-10, whereby applicant's term "halftone" is identical to Tanaka's term "gray level" defined in sect.[0065]; and

(d) determining a plurality of feature quantities (e.g., brightness) of the abnormal pattern based on an image of the abnormal pattern, as shown in Fig.7, 8, 11-23 and 25, as exampled in sect.[0043], [0163] and many others throughout the document, the additional limitation "*including differentiated halftone values between pairs of adjacent pixels*" being expressly recited by Tanaka et al. in sect.[0164]/ll.7-11; and

(e) designating a range of classifying the type of abnormal pattern based on the distribution 40 shown in Fig.7,8 of the plurality of feature quantities of the abnormal pattern, as shown in Fig.7-26 and recited in sect.[0146] through sect.[0179].

► Claim 6 recites the same limitations as claim 1, but directed to an apparatus instead of a method. Therefore, claim 6 is rejected by the same token and over the same prior art reference as claim 1.

► Claims 12-14 recite the same limitations as claim 6, wherein the additional limitation of a calculation unit is inherent in Tanaka's, as is obvious in Fig.6(a) and 6(b) showing calculation steps in the process of making difference image and its distribution, whereas a display unit 17 is shown in Fig.1 and recited in sect.[0053]/ll.5-9.

► Regarding claims 2-4 and 7-10, Tanaka's range for classifying the type of the abnormal pattern, e.g. 40 in Fig.7 and 8, is designated on the basis of the distribution chart shown in Fig.7 as defined in sect.[0030] created from the feature quantities of the

abnormal pattern, as recited in sect.[0100], wherein the additional limitations of claim 3, i.e., regarding automatic classification and the modification of the condition for such automatic classification and its storage in the recipe, are all inherent in Tanaka's, as shown in Fig.7-27 and recited in sect.[0146] through sect.[0179], wherein Fig.27 unambiguously implicates the inherent automation process, as recited in sect.[0183].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. in view of Suzuki et al. (US Pat. Pub. 2004/0021074).

► Tanaka et al. show all the limitations of claims 5 and 11, as previously applied to the respective parent claims 2 and 7, except the recitation that a sum of absolute values of the differentiated halftone values between each pairs of adjacent pixels, i.e., a difference signal between neighboring pixels, is also included in the feature quantities considered for classification.

Suzuki et al. disclose in Fig.5 a charged particle beam scanning apparatus similar to Tanaka's and applicant's. However, in addition to taking the conventional difference image between an inspection image and a reference image, as implicated in sect.[0004]/ll.10-24, Suzuki et al. also take a difference signal between neighboring

pixels, i.e., the differentiated halftone values between each pairs of adjacent pixels, as recited in sect.[0005]/ll.1-10, sect.[0021]/ll.12-15 and sect.[0022]/ll.15-22.

While Suzuki's difference signal between neighboring pixels is sufficient to characterize the defect, it would have been obvious to one of ordinary skill in the art to calculate a sum of those difference signals to make it commensurate with Tanaka's method of evaluating the distribution of the difference image between an inspection image and a reference image, so that they can be plotted in one distribution chart of the type as taught by Tanaka et al. in Figs.7 and 8, since it is generally known in the art that a sum of individual values always provides a stronger indication than any of the individual values themselves, just logically because of the cumulative effect of a sum. Furthermore, it is easier to make decision based on a single value that can be plotted in a chart similar to Tanaka's Figs.7 and 8, instead of having to draw conclusion from a large number of individual values.

Final Rejection

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP §706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then

the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Relevant Prior Art

6. These prior art references made of record but not relied upon are considered pertinent to applicant's disclosure: USPAT 6,700,122, issued to Matsui et al.; USPAT 6,329,826 issued to Shinada et al.; US Pat. Pub. 2003/0015659 issued to Honda et al.; USPAT 6,744,266 issued to Dor et al.; and US Pat. Pub. 2002/00289399 issued to Nakasuji et al.; all of which would have been equally qualified, either alone or in combination, to anticipate or render obvious applicant's claimed invention.

7. A new search have resulted in three further prior art references, which --in addition to the previous five references of record-- are also applicable, either alone or in combination, to anticipate or render obvious all the claims of applicant's invention:

(a) USPAT 6,703,850, issued to Nozoe et al., with reference to Col.8/ll.58-67 and Col.15/46-52;

(b) USPAT 6,583,634, issued to Nozoe et al., with reference to Col.8/ll.56-65 and Col.15/40-46; and

(c) USPAT 6,172,363, issued to Shinada et al. with reference to Col.11/ll.14-17, Col.16/ll.38-46, and Col.25/40-48.

Response to Applicant's Arguments

8. The following is the examiner's response to Applicant's arguments:

► Regarding claims 1, 6 and 12, in contradiction to Applicant's argument, Tanaka et al. do determine the abnormal pattern including differentiated halftone values between pairs of adjacent pixels, as recited in sect.[0164]/ll.7-11. Even Suzuki et al. also teach to determine the abnormal pattern including differentiated halftone values between pairs of adjacent pixels, as recited in sect.[0005]/ll.7-11. therefore, Applicant's argument is unpersuasive.

► In response to Applicant's argument that there is no suggestion to combine the references of Tanaka et al. with Suzuki et al., the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971). references are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA) 1969.

In the instant case, it is much easier to draw conclusion from a single cumulative value (such as in Tanaka's Fig.7 and 8), than having to make decision based on a large number of individual values.

► In response to Applicant's argument that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. *In re McLaughlin*, 443 F.2d 1392; 170 USPQ 209 (CCPA 1971).

In the instant case, it is within general knowledge in the art that a sum of either the halftone differences or the absolute of the differentiated values always provides a stronger indication rather than any of the individual values themselves, just on a logical basis because of the cumulative effect of a sum. Furthermore, it is easier to make decision based on a single value, instead of having to draw conclusion from a large number of individual values, as already recited previously.

Communications

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone

number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
February 10, 2005

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800